

Appl. No. : 10/776,475
Filed : February 10, 2004

AMENDMENTS TO THE DRAWINGS

Please amend the drawings as follows:

Please replace the entire hand-drawn and informal **Figures 23B and 23C** with those found in one sheet of corresponding **Replacement Sheet** attached at the end of this paper. No new matter is being added by this amendments to the drawings.

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REMARKS

In the Office Action mailed November 21, 2005, the Examiner states that corrected drawings in compliance with 37 C.F.R. § 1.121(d) are required for Figures 23B and 23C. The Examiner also objects to Claims 15-19 and 28-31 for informalities. The Examiner also rejects Claims 19, 21, 23, 27, 28, 32, 36-47, 51, and 52 under 35 U.S.C. § 102(b) as being anticipated by Welch et al. (U.S. Patent No. 5,864,574 – “Welch”). The Examiner also rejects Claims 1-4, 6-9, 13, 15, 19-21, 23, 27, 28, 32, 36-45, 47, 51, and 52 under 35 U.S.C. § 102(b) as being anticipated by O’Brien et al. (U.S. Patent No. 5,793,521 – “O’Brien”). The Examiner also rejects Claims 1-18, 20, 22, 24-26, 29-31, 33-35, 48, and 49 under 35 U.S.C. § 103(a) as being unpatentable over Welch, and further in view of O’Brien. The Examiner also rejects Claims 5, 10-12, 14, 16-18, 22, 24-26, 29-31, 33-35, 46, 48, and 49 under 35 U.S.C. § 103(a) as being unpatentable over O’Brien. The Examiner states that Claim 50 would be allowable if rewritten in independent form including all of the limitations of the base and any intervening claims. By this paper, Applicant addresses the foregoing issues raised by the Examiner.

Corrected Drawings

Applicant submits herewith formal drawings for Figures 23B and 23C, as described in the “AMENDMENTS TO THE DRAWINGS” section of this paper.

Objection of Claims Based on Informalities

Claims 15-19 and 28-31 are amended so that “waveguide grating coupler” is changed to “grating coupler.”

Rejection of Independent Claims Under 35 U.S.C. § 102(b)

The Examiner rejects independent Claims 1, 19, and 36 under 35 U.S.C. § 102(b) as being anticipated by O’Brien. The Examiner also rejects independent Claims 19 and 36 under 35 U.S.C. § 102(b) as being anticipated by Welch.

Rejection of Claim 1

The Examiner rejects Claim 1 under 35 U.S.C. § 102(b) as being anticipated by O'Brien. Applicant notes that O'Brien does not appear to be related to grating couplers, but rather optical gain medium devices having tapered or flared amplifiers. More particularly, O'Brien does not teach coupling of light between a grating coupler and an optical element that is located above a planar waveguide, as recited in the amended form of Claim 1.

For at least the foregoing reasons, Applicant respectfully requests that the O'Brien-based rejection of Claim 1 be reconsidered and be withdrawn.

Rejection of Claim 19

Claim 19 was rejected under 35 U.S.C. § 102(b) as being anticipated by O'Brien, and also as being anticipated by Welch.

With respect to O'Brien, Applicant reiterates that O'Brien teaches a different device, and that O'Brien does not teach coupling of light between a grating coupler and an optical element that is located above a grating, as recited in the amended form of Claim 19.

With respect to Welch, Applicant notes that Welch does not teach a limitation where curved elongate scattering elements have curvatures defined by substantially elliptical paths. Welch simply discloses (in reference to Figure 9) that the grating (119) "has a curvature that matches the curved phase fronts of the lightwaves propagating in the flared gain section 114. The light emerges through a top or bottom surface of the amplifier chip 120 as a substantially collimated beam." (Column 10, lines 7-13.)

Applicant notes that an elliptical curvature shape is not mentioned or suggested in Welch. Applicant believes that even if Welch's grating curvature can be elliptical, *either* the phase fronts will *not* match the curvature of the grating, or the light emerging through the top or bottom surface of the amplifier chip 120 will *not* be substantially collimated for any of the amplifier chip (120) configurations disclosed. For these reasons, Applicant respectfully submits that Claim 19 is not anticipated by Welch. Moreover, Welch does not make any suggestion as to why elliptical shaped gratings, or any particular shape of gratings, might be desirable.

For at least the foregoing reasons, Applicant respectfully requests that the rejections of Claim 19 based on O'Brien and Welch be reconsidered and be withdrawn.

Rejection of Claim 36

Claim 36 was rejected under 35 U.S.C. § 102(b) as being anticipated by O'Brien, and also as being anticipated by Welch.

With respect to O'Brien, Applicant notes again that O'Brien does not appear to be related to grating couplers, but rather optical gain medium devices. Moreover, because O'Brien does not teach a fiber end in the near field of the grating coupler, where the grating coupler has elongate scattering elements within the Rayleigh range of the fiber end, and where the elongate scattering elements are curved to convert wavefronts of light between planar wavefronts and non-planar wavefronts, O'Brien does not anticipate Claim 36.

With respect to Welch, Applicant likewise notes that because Welch does not teach a fiber end in the near field of the grating coupler, where the grating coupler has elongate scattering elements within the Rayleigh range of the fiber end, and where the elongate scattering elements are curved to convert wavefronts of light between planar wavefronts and non-planar wavefronts, Welch does not anticipate Claim 36.

For at least the foregoing reasons, Applicant respectfully requests that the rejections of Claim 36 based on O'Brien and Welch be reconsidered and be withdrawn.

Rejection of Independent Claim 1 Under 35 U.S.C. § 103(a)

The Examiner rejected independent Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Welch, and further in view of O'Brien.

Applicant notes that Welch does not appear to disclose or suggest any form of a curved sidewall. As discussed above, O'Brien, discloses a linear flare, a parabolic flare, and "some other shape, such as the rectangular amplifier sections. However, neither Welch nor O'Brien teach an integrated optical apparatus having a combination where a flared portion of a grating coupler includes at least one hyperbolic-shaped sidewall and the flared portion having a grating positioned to couple light between the grating coupler and an optical element above the planar waveguide.

For at least the foregoing reasons, Applicant respectfully requests that the rejection of Claim 1 under 35 U.S.C. § 103(a) be reconsidered and be withdrawn.

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Rejection of Dependent Claims

The rejected dependent claims include additional limitations which Applicant believes are patentable when combined with the limitations of their respective base claims, some of which are discussed above. Thus, Applicant respectfully submits that these dependent claims are patentable for at least the reasons discussed above.

Allowable Subject Matter of Claim 50

Applicant thanks the Examiner for his careful and thoughtful consideration of the allowability of the subject matter of Claim 50.

CONCLUSION


Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In view of the above remarks, Applicant submits that the application is in condition for allowance and respectfully request the same. If the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, the Examiner is invited to initiate the same with the undersigned.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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